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ABSTRACT

Management guidelines for library planning and a strategic planning program profile based on the literature were used in the planning process for implementing access to databases on CD-ROM at the Daniel Library of the Citadel, Military College of South Carolina. According to this model, the planning process would consist of five stages: (1) organizing a departmental automation planning committee; (2) conducting a needs assessment; (3) producing a planning document; (4) evaluating hardware, software, databases, and contracts; and (5) establishing management, training, and use policies. As the planning process evolved, however, the needs assessment was not prepared as completely as it might have been and a formal planning document was not produced. Evaluation was limited to hardware and databases, a review of vendors was not completed, and the details of licensing and subscription contracts were not examined. An evaluation questionnaire was not created, with the result that feedback that might have been helpful in establishing policies was lacking. It is concluded that in future planning, a designated task force should prepare a proper planning document, including background, goals and objectives, and a strategy that has involved environmental considerations and alternative possibilities. It is further recommended that the library automation committee should represent the library on the college-wide computer services committee to provide a critical link between the library and the other information and computing units of the college. (SD)

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PLANNING AND PREPARATION FOR CD-ROM IMPLEMENTATION: THE CITADEL LIBRARY

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February 1990

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INTRODUCTION - BACKGROUND

Electronic access to information through OPACs (online public access catalogs) and end user searching of online and CD-ROM (compact disc read only memory) databases mandate long-range and short-term planning for libraries. As developing technologies emerge, implementation and support of access will make CD-ROM as crucial as traditional information handling techniques.

The Citadel, The Military College of South Carolina, located in Charleston, S.C., is primarily a 2,000-student resident liberal arts college with an additional 800 full-time equivalent evening graduate/undergraduate enrollment of adults. The Citadel Library has been a follower rather than a pioneer in the implementation and use of emerging technologies. The library's history with online information dates back to its first OCLC (Online Computer Library Center) services (cataloging and interlibrary loan) in 1980. Later, OCLC acquisitions service was added in 1986. Most recently (1989), the library has added the cataloging and circulation modules of Data Research Associates' ATLAS (A Total Library Automated System). The Reference Department's online bibliographic searching through commercial database vendors like Dialog did not begin until late 1982.

Currently, the Reference Department has added its first CD-ROM technology with accompanying software and hardware. The library's first CD-ROM databases were SilverPlatter's ERIC (Educational Resources Information Center) and Bowker's

BIP Plus (Books in Print Plus). The prospect of adding additional databases through a high capacity (up to 600 megabytes per disk) storage system like CD-ROM to the college local area network (LAN) would afford the opportunities to impact information retrieval throughout the campus. Such an integrated approach to information retrieval would permit the Reference Department to perform its primary function, information access, more effectively.

The purpose of this study was to review the library's planning process for implementing an emerging technology (e.g., CD-ROM). Using strategic planning methodologies to assist the library implement CD-ROM, the researcher reviewed the library's planning "shortcomings" and outlined recommendations for future planning of CD-ROM and related technologies.

LITERATURE REVIEW

Generally, CD-ROMs are single-sided 12cm (4.72 inch) discs with approximately 550 mbytes (formatted) storage capacity. With few exceptions, most CD-ROM publishing has been of major databases, for instance, a few of the hundreds offered through online services like Dialog Information Services and BRS Information Technologies. Although The Citadel library did not receive its first CD-ROM until 1989, Hendley (1987) reports laser optical storage devices reached the commercial market in 1978 (videodisc), in 1982 (compact audio disc), and in 1985 (cdrom).

The literature review revealed that library planners and authors recommend the general principles and procedures found in most texts on decision making and the planning and preparation for major organizational changes (Ramsey & Ramsey, 1986; Wood & Young, 1988). For example, based on long-range planning, goals, objectives, and tactics of the organization, the planner or library director must operate within the college mission "...to translate long-range goals into more specific short-term objectives that can be quantified" (Ramsey & Ramsey, 1986, p. 7). One way to begin this mission to tactics hierarchy is planning with a pilot project by acquiring one product and system and using it experimentally (Miller, 1986). For a well-informed decision to incorporate CD-ROM technology into the reference system, Downing (1988) advocates planning for hardware, databases, search and retrieval software, and user education.

To transfer a library's mission and goals into a project to obtain a specific objective like CD-ROM, many authorities (Miller, 1986; Vandergrift, Kemper, Champion, & Hannigan, 1987) advocate establishing guidelines like the following:

1) Project manager
2) Needs assessment or feasibility study
3) Planning document
4) Evaluating hardware, software, databases, and contracts
5) Management, training and use policies.

Gates (1986, p. xii) joins many others in reminding us that CD ROM was not designed "...as a product on its own but is an offshoot of the decision of Sony and Philips to use optical digital storage for music to create the very successful, high quality audio product we all know as the Compact Disc." Because CD-ROM technology has been built on recording industry success, J. B. Lowe (1988, p. 38) sees great economies of scale. Nevertheless, Lowe recognizes that until optical technology establishes itself in publishing, "...each player is going to expect the others to pay for opening the game and keeping it going."

Herther (1989, p. 103) reports lingering doubts about CD-ROM and lists questions that must be answered by a library's planners:

> Is it a replacement for some existing item in the collection?
>
> Is CD-ROM an added service that the organization would be providing above and beyond their 'regular' collections and services?
>
> Is CD-ROM an experimental information tool, one requiring special consideration apart form the normal budgetary and administrative channels?

These "lingering doubts" and expecting "others to pay for opening the game and keeping it going" are characteristic of the introductory stage of the classic product life cycle

model. Traditionally, a product life cycle exhibits four stages (Wood & Young, 1988; Kotler, 1982, p. 297):

1. INTRODUCTION is the period of slow sales growth as the product is introduced in the market.
2. GROWTH is a period of rapid market acceptance.
3. MATURITY is a period of slowdown in sales growth because the product has achieved acceptance by most of the potential buyers.
4. DECLINE is the period when sales show a strong downward drift.

Nicholls and Erkkila (1989, p. 134) see CD-ROM at the peak of the introductory period of product life cycle. During this introductory cycle, many libraries acquired optical systems on a trial basis. Many such trial systems became permanent. Zink (1990) credits this on trial method of selection as one reason for insufficient planning.

After observing the industry survive many of the barriers to CD-ROM acceptance, the library's reference department staff can benefit from the experiences of libraries and publishers who have survived the beginnings of an unstabilized market. As CD-ROM technology enters the growth stage of product life cycle, library long-range planning should prepare to meet the challenging changes.

RESULTS

Industry Planning Procedure for CD-ROM Technology

Coordinating management guidelines for library planning (Miller, 1986; Vandergrift, Kemper, Champion, & Hannigan, 1987) with a modified strategic planning program profile from Holloway (1986) proved successful as a planning process for CD-ROM technology. Adapting the following guidelines from (Miller, 1986; Vandergrift, Kemper, Champion, & Hannigan, 1987),

1) Project manager
2) Needs assessment or feasibility study
3) Planning document
4) Evaluating hardware, software, databases, and contracts
5) Management, training and use policies.

and placing the following Holloway (1987) profile within the planning document section, establishes a procedure of library planning for CD-ROM technology:

1. Background
2. Mission
3. Goal/Objectives
4. Environmental considerations
5. Strategy/Alternatives/Resources/Tactics
6. Conclusions

Project manager

To implement change like CD-ROM technology, a planning

group must be organized (Curzon, 1989). If the group is large, a subgroup or taskforce of committee members and other library staff and students may be best for analyzing specific tasks. Group leadership may be selected or appointed. Curzon (1989) also suggests setting parameters for the group. For example, stating the authority of the group is important. The organization of the group or task force is essential before beginning needs assessment.

Needs assessment

The first responsibility of a task force is determining the feasibility of CD-ROM technology in its library. Vandergrift, Kemper, Champion, & Hannigan (1987, p. 23) suggests library staffs examine what effect CD-ROM technology will have on the following services and holdings:

> print and nonprint tools, including microfiche and microfilm;
> access to online databases;
> subject boundaries of the collection;
> programs or user needs that must be supported;
> clients served;
> staffing: i.e., coverage, staffing levels and degree of reference services;
> equipment inventory: including types of microcomputers in-house; personal computers for public access; printers accessible to patrons.
> budget considerations: in libraries under financial

constraints, pricing may play a pivotal role in determining which system is selected.

> users' information needs, both currently unfilled and projected;

> the competitive environment, which requires an assessment of technological trends; evaluation of legal and regulatory restraints.

Planning document

After appointing/selecting a task manager and outlining needs assessment, a task force should prepare the planning document. A planning document may include background, mission, goals or objectives, environmental considerations, strategy, alternative analysis, resources, tactics, and conclusions. Graves, Harper, and King (1987) and Hoffman (1989) check the impact of CD-ROM implementation on reference service as well as Collection Development, Resources, Organization, and Management. Because all these areas are affected, a task force should judge how the library mission, goal, and objective to embrace laser disk technology will impact personnel, facilities, policies, resources, budgets and planning in library functions. After selecting CD-ROM as a functional plan to provide online bibliographic searching, a task force outlines resources needed to implement the plan. Generally, resource requirements are projected in financial terms but may include statements on any scarce resource (Sawyer, 1986, p. 259). Zink (1990) claims that "a long-term

funding solution must be adopted at the outset." To coordinate staff and physical resources and the strategy's impact, a task force prepares planning for resource allocation and evaluation of vendors/suppliers.

Evaluating hardware, software, databases, and contracts

A task force should evaluate hardware, software, contracts and databases before selection. The minimum requirement for CD-ROM technology is a microcomputer and a CD ROM reader. A hard disk drive with at least one floppy drive and printer is recommended. Downing (1988) reported working memory requirements of 512k, with somé databases now listing 640k and a controller card. Many vendors sell workstations to run their products. Eaton, MacDonald and Saule (1989, p. 86) notes that "newer [CD-ROM disk] drives may have multiple capabilities for graphics, sound, and motion." Therefore, one problem the task force must resolve during planning is the comparison of a database provided by different vendors. Purchasing a particular database may depend on the software's search and retrieval capacity.

According to Downing (1989), most search software provides "novice" and "expert" search strategies along with Boolean capabilities, truncation, and broad indexing features. Because human factors is important to software design, the following software and retrieval issues checklist from Eaton, MacDonald and Saule (1989, p. 45-46) focuses important questions:

> What impression does the overall interface make?
> Are function keys used clearly and appropriately?
> Are screen displays clear and well organized?
> Can search strategies be modified easily?
> Can search strategies be saved and re-executed?
> Are appropriate processing messages displayed?
> Are help screens readily available from any point in search?

Within the scope of its mission and goals, a library will select databases. Brunell (1989) and Downing (1989) pose points a task force should consider when selecting databases:

> Buy or lease?
> How Many?
> Depth of Coverage
> Number of discs included
> Update frequency
> Indexed fields

Databases may also necessitate other requirements. For instance, many databases like ERIC use more than one drive. For purchasing hardware and a CD-ROM reader, SilverPlatter's catalog of prices effective January 1, 1990 recommends the following product information for daisy-chained hardware drives (SilverPlatter Information, Inc., 37 Walnut St., Wellesly Hills MA 01181; 617-239-0306):

1. Determine if the drive type and model number support

the number of drives desired.

2. Determine the number of controller cards needed to support your drives.
3. Determine the number of open expansion slots in your computer. One open expansion slot is required for every controller card.
4. Determine whether Microsoft MS-DOS CD-ROM Extension is required for the drive model selected.

Software is normally received on floppy disk and is loaded with DOS commands. Characteristic of many major vendors, SliverPlatter recommends consulting its customer support if the client does not know which drives and controller cards to purchase.

Software evaluation and CD-ROM hardware have been "...closed de facto, simply because adequate standards did not exist to provide compatibility across hardware, operating systems, search software, and files" (Miller, 1986, p. 755). Nevertheless, Tenopir (1989, p. 68) sees a possibility beyond the single workstation because all producers that use the High Sierra/ISO 9660 standard for volume and file structure, ensure that

> MicroSoft MS-DOS Extensions software makes every CD-ROM drive act as just another peripheral and allows every drive and disc to be searched or shared.

SilverPlatter claims complete CD-ROM networking by linking 20 workstations to a tower of CD-ROM drives. Through

this MultiPlatter (TM) service, SilverPlatter advertises the following features:

> Includes a usage statistics package to help you budget more effectively by tracking the demands on your CD-ROM products and services.
> Offers an optional dial-in software module that bridges the MultiPlatter network to an existing general area network.
> Offers an optimal dial-in capability to bring CD-ROM access to those outside the network area.

In the first MultiPlatter (TM) test site at Boston College, Grant and Stalker (1989) reported testing DISSERTATION ABSTRACTS and ABI/INFORM from University Microfilm International as non-SilverPlatter products that were added to the network. Adding the possibility of other products and dial-in capability from outside the network area forces the library to examine additional license and contract information.

Currently, most CD-ROM database vendors require subscription or licensing agreements (Vandergrift, Kemper, Champion, & Hannigan, 1987). A planning task force should examine contract conditions carefully. By analyzing a typical subscription and license agreement, a task force should seek answers to many of the following:

1) What products are part of the license agreement? How must the licensee restrict, control or secure?

> Databases?

> Software?

> User manual?

2) What are the terms and conditions of the license agreement?

> How may the agreement be terminated?

> How and when will database disc and software be updated?

3> Must database (disc) be returned?

3) Ownership of data and databases?

> What are the limits on view and print-outs?

> Sale?

> Downloading?

4) Are one-time purchases of retrospective files possible?

> Are there discounts for additional subscriptions to the same database?

5) How will vendor supply telephone support to the licensee?

Management, training and use policies.

Planning for workstation furniture, devices, and space requirements is a necessary prerequisite for use policies. For example, adequate telephone lines for possible modem access to commercial online systems should be part of a workstation. Because workstations will be subject to physical abuse and computer viruses, the reference staff will need to plan for monitoring. Bristow (1988) specifically

rejects the idea of a separate 'center' for computer assisted instruction. Consequently, these workstations should be placed near the Reference Desk/Office.

Whether before or after assessment of hardware, software, databases, and contracts, a plan for management, training, and use policies is essential to successful implementation of CD-ROM technology. Adjustment for online searchers should be simple. For other library staff and end users, instruction and/or search planning will vary. Downing (1988, p. 26) advocates "...at least a month for staff members to become acquainted with the new system before they are expected to teach patrons how to use it successfully."

Library management should establish who will administer and maintain the system(s). Eaton, MacDonald and Saule (1989, p. 52) lists staffing issues that will vary depending on organizational structure:

1. Who will oversee or coordinate all functions?
2. Who will serve as contact person with vendors?
3. Who will maintain equipment and supplies?
4. Who will assist patrons with day-to-day search questions?
5. Who will train searchers or construct library-supplied documentation and "cheat sheets"?
6. Who will evaluate currently used systems and recommend future selections?
7. What departments will be responsible for bibliographic control and who will monitor

copyright and licensing restrictions?

To evaluate its decision, Eaton, MacDonald and Saule (1989, p. 67) suggests that libraries establish "...some evaluation mechanism for optical systems from the start of implementation." These evaluations, whether on-paper or on-disc, may also be supplemented by library staff observations and interviews. I. B. Lowe (1988) suggests collecting the following data:

1. Statistics on usage, consisting of demographics of users, class level, major field of study, age, sex, purpose of the search, prior computer experience, prior searching experience, prior library experience;

2. Statistics on patterns of use, i.e., date, starting time, length of session, resources used (e.g., database, vendors, systems), and citations retrieved;

3. Assessment of user satisfaction with the system, training, documentation, and general support; and

4. Assessment of user independence, i.e., time spent with supervisor and types of questions asked by user.

The Citadel Library Planning Procedure for CD-ROM Technology

The library Reference Department functions to support the college research and teaching mission. Within this function is the department's chief responsibility to promote and provide information retrieval, both manually and

electronically. In applying the planning model to CD-ROM technology to The Citadel Library Reference Department, the same management guidelines for library planning and strategic planning program profile were used.

1) Project manager
2) Needs assessment or feasibility study
3) Planning document
4) Evaluating and/or selecting hardware, software, contracts, and databases
5) Management, training and use policies.

Project manager

The library director appointed a departmental Automation Committee in spring 1987. The committee was primarily charged with whether to recommend an integrated online library system (IOLS). During IOLS needs analysis for IOLS planning, the committee reviewed and evaluated various systems, including CD-ROM based online systems like Library Corporation's BiblioPhile.

Needs assessment

Because of budget considerations and use justification, the Automation Committee did not do a complete analysis. Because education degrees are the predominate graduate programs of the college, members supported education (ERIC) as the first CD-ROM priority. Therefore, the committee assumed librarian mediated access to commercial databases for

other subjects in the curriculum.

CD-ROM technology was judged supplemental to printed indexes. However, with many graduate and evening students holding full-time jobs, the committee saw the need for rapid and more efficient access to bibliographic information. With mediated online searching, the patron was required to wait 48 hours for completion of search requests.

Planning document

As background, the size and scope of the library's efforts to provide automated information retrieval services began in late 1982. Early mediated searches were provided through modem access to DIALOG or BRS Information Technologies. Excluding the first and last years of online searching, 756 searches were performed in 1984 compared to 919 in 1988. The costs of searches increased from $4,979 in 1984 to $6,610 in 1988. Because these increases are likely to continue, a need to consider other alternatives like CD-ROM grew evident.

The library mission within the scope of the college mission, fulfills the long-range mission principle as

> A statement of what an organizations is, why it exists, and the unique contribution it can make (Holloway, p. 17).

The following excerpt and subsequent goal from the DANIEL LIBRARY MISSION STATEMENT (personal communication 1988)

clearly obligates the Reference Department to organize, promote, and improve CD-ROM technology:

THE CITADEL

DANIEL LIBRARY MISSION STATEMENT

The primary mission of Daniel Library is to provide the resources, services and library environment that support the Citadel's academic goals, involving both students and faculty. The library should facilitate students' ability to learn and to conduct effective research and information gathering as it relates to their studies and research at The Citadel. This role calls for contributing to the liberal arts and professional education of students by developing their intellectual skills and independence through the library's various collections, reference expertise, and services such as interlibrary loan and online data base searching.

GOAL 5. To acquire and maintain online, laser disk or other database services for retrieving bibliographic or other information in response to requests from library users.

a. To provide such services on a free basis, funds permitting, to Citadel faculty, staff and students so as to encourage scholarly activity and research.

b. To continually explore and research new technologies and opportunities that increase services

and access to information.

The library's stated goal is to provide laser disk services on a free basis through librarian mediated bibliographic computer searching of commercial databases. To enhance this objective to provide online information service, the department sought to add laser disk service through CD-ROM technology.

During IOLS analysis committee members examined environmental considerations for both the IOLS and CD-ROM technology. Members stressed the importance of meeting the competition's recently established acquisition of CD-ROM capability. This capability gave the competition and their institutions a definite advantage in serving the recertification and degree requirements of local area public school teachers.

Evaluating hardware, software, databases, and contracts

The Automation Committee evaluated hardware, software, databases, and contracts by developing a strategy and alternatives. Using 1987 OCLC vendor information, H. T. Nath, committee chair, reported the following costs estimates for hardware and ERIC databases (personal communication, November 9, 1987):

1.	RIE, 1967-1976	$300
2.	RIE, 1977-1981	300
3.	CIJE, 1969-1981	300

4. Phillips CM 100 $ drive reader.	900
5. IBM with 2 disk drives and 640k RAM. (IBM compatible, approximately 1,000 less)	2,900
6. Monochrome monitor	100
7. Printer	300
Minimum total	5,100

Questions considered were (H. T. Nath, personal communication, November 9, 1987):

1. Should The Citadel implement CD-ROM at this time?
2. Should ERIC be the first CD-ROM file to be chosen?
3. Should OCLC be the ERIC vendor?
4. Should more expensive hardware be chosen?
5. Are there any other CD-ROM files which should be purchased?

To support recommending ERIC backfiles, the committee member responsible for computer searching reported the library spent approximately $800 for ERIC searching during the preceding year. The committee recommended two four-drive CD-ROM readers and two IBM PS/2 model 30 with color monitors. Action on committee planning was a recommendation to purchase ERIC files and hardware immediately.

The Automation Committee conducted no review of management, training and use policies. A few informal statements on use and training were discussed, but no

guidelines or suggestions were recorded.

In conclusion, the organization (library faculty and director) chose SilverPlatter's ERIC and Bowker's BIP Plus as the department's first laser disk systems. Instead of purchasing two IBM PS/2, resources were allocated to purchase one Hitachi four-drive reader and the software was loaded on an OCLC M310 Wyse (IBM compatible workstation). The workstation is shared for OCLC and CD-ROM searching. Actual costs included:

1. Hitachi 3500 (four-drive reader)	$1709
2. ERIC (including retrospective files and one year subscription	1200
3. Books in Print Plus (first year subscription)	1161
	$4069

The library director expanded an organizational strategy into a financial strategy by seeking outside funding. As principal author, the director, R. J. Wood (personal communication, May 1988), submitted a grant application to DuPont for CD ROM resource sharing. The grant sought "...funds to develop and implement a system for resource sharing based on laser disk and telefacsimile transmission technologies" for a consortium of five area academic institutions.

DISCUSSION AND RECOMMENDATIONS

Critique

The Citadel met industry planning standards for CD-ROM technology by establishing a departmental automation committee (Automation Committee) with an appointed chair. Because the committee was organized to accept or reject IOLS, a committee task force should have been formed to consider CD ROM as a separate issue. This task force may have consisted of all members, plus other staff and students or faculty.

Despite its specific charge, the committee operated as a team for project analysis of CD-ROM technology. Informally, the committee examined many of the Vandergrift, Kemper, Champion, & Hannigan (1987, p. 23), suggestions for how CD-ROM may improve library operations. A delineation of the strengths and weaknesses for the various suggestions would have provided documented evidence of a more complete needs analysis.

Although the committee did not prepare a formal planning document, it did follow a traditional planning profile. An established library goal and objective to acquire and maintain laser disk services for retrieving bibliographic or other information in response to requests from library users was met with a CD-ROM technology review for one workstation. The committee was primarily charged with whether to recommend an integrated online library system (IOLS). After deciding for IOLS over CD-ROM, the committee should have suggested

planning for CD-ROM integration within its IOLS recommendations.

For environmental considerations, the committee extensively assessed local area library progress in CD-ROM. Members suggested waiting for developments like CD-WORM or CD-I. Little or no review was conducted on subscription constraints.

Evaluation was pretty much limited to hardware and databases. By analysis of minimum requirements for a single CD-ROM workstation, the committee met planning requirements for hardware and databases analysis. However, analysis of software and subscription contracts was weak. Little or no review of vendors was completed. Other than knowing that most acquisitions would be by subscription, the detail of licensing and subscription contracts was not examined.

Library planning and preparation for management, training and use policy was not examined as part of the Automation Committee review process. Because the library has not placed the CD-ROM workstation in the public services area for end-user access, evaluation and feedback from users has not been possible thus far. Moreover, the committee did not prepare an evaluation questionnaire for feedback from workstation use by library staff. This failure was a major weakness of the committee.

Another major weakness of planning was funding beyond the current single workstation. Because the college and library goal/objective is to provide free online

bibliographic searching, the committee should have offered suggestions for modifying this objective. Because many non-Citadel personnel will be using the service, perhaps a program of subsidized service would be a workable alternative for all users. This approach would avoid having to charge if licensing agreements later demanded a per charge usage fee that the library could not absorb.

Recommendations

Because the library has already partially implemented a CD-ROM workstation, my first recommendation is that the Automation Committee be re-established as a standing committee to prepare for new innovations. The first task of the revised committee should be to prepare recommendations for the management, training and use of current and future CD ROM additions. In this planning, the committee should prepare a planning document to coordinate the integration of which additional CD-ROMs will be purchased and which databases will be continued through mediated searches of commercial database vendors.

In future planning, the committee or its designated task force should prepare a proper planning document. Such a document should include background, goal/objective and a strategy that has involved environmental considerations and alternative possibilities. As part of its analysis, the committee should recommend tactics for implementation. Before placing the current CD-ROM workstation in the public

services area for end-user searching, the committee should prepare a paper or disc-based evaluation instrument for feedback. The committee should also be charged to plan for the integration of IOLS and CD-ROM interaction. Such planning should include long-range planning for an intelligent IOLS and CD-ROM network.

To properly represent the library's concerns in emerging technology, the library's Automation Committee chair should represent the department on the college-wide Computer Services Advisory Committee. This critical committee representation is needed for coordination between the library and all other information/computing units of the college.

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